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dullest on the steamed turnip, where there was also a marked production of the brown pigment. The organism was also grown in fermentation tubes using the various kinds of sugars. It is not an acid or gas producer. A brief summary of characters is given at the end of the paper. The organism is closely related to Wakker's *Bacterium hyacinthi*, from which it differs chiefly in its pathogenic properties. This paper is an important contribution to our knowledge of bacterial diseases of plants. Great care was observed in details of making media, and the manner in which the infection experiments were conducted should be highly commended.

In a second paper on the same subject[1] Dr. Smith deals largely with methods of prevention, giving the result of field studies made in 1897. Nine-tenths of the infections are through water pores. Infections by means of the gnawings of insects were also observed. The disease has been successfully inoculated into the black mustard, and is common in some places on charlock. No evidence has been obtained to show that it is transmitted by seed. A contaminated soil is the most frequent source of infection. The observations here recorded leave little room to doubt that the organism lives over winter in the soil, that it is often transplanted from contaminated soil to healthy fields in diseased seedlings, and that the preparation of healthy seed beds, *i.e.*, on soil free from this organism, is one of the most important preventive measures. Of course, rotation of crops would also be an effective remedy.

L. H. Pammel.

A New Laboratory Manual.—To the many laboratory manuals is added a new one in the field of botany,[2] which is intended to give the student a general view of the subject and at the same time to lay a foundation upon which more advanced studies may be built. The author suggests that the rather extended scope of the book need not prevent its use for briefer courses, since by judicious selection certain parts only may be used where the entire field cannot be covered. One hundred and ninety-one illustrations add to the attractiveness of the book, and in the main they are well selected from good sources. Though the illustration of a laboratory guide is a device for conveying information rather than promoting independent investigation, it is by no means certain that it is a reprehensible practice when, as is the case in most colleges, a very small percentage only of the students of science are likely ever to have the opportunity to devote their lives to research. T.

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[1] The Black Rot of the Cabbage. *Farmers' Bulletin*, No. 68. U. S. Dep. of Agric., Washington, D. C., Jan. 8, 1898.

[2] C. H. Clark, *A Laboratory Manual in Practical Botany*. New York, American Book Company (1898), 271 pp.

A Guide in Vegetable Physiology. — Professor Arthur of Purdue University has issued in pamphlet form an outline for thirty-five laboratory exercises in vegetable physiology,[1] which are intended to guide the student in manipulation while avoiding the provision of information as to the purpose of the experiments or the deductions to be drawn from them.

Digestion of the Albumen of the Date. — M. Leclerc du Sablon, in the *Revue Générale de Botanique* for Nov. 15, 1897, publishes a paper on the digestion of the "albumen" of the date, in which it is shown that not only is this albumen incapable of digesting itself, but that the diastases secreted by the cotyledon, which attack the cellulose, do not penetrate into the albumen, their action appearing only in the region of contact between the cotyledon and the albumen, only the enzyme which leads to the production of fatty acid passing from the cotyledon into the albumen, where it begins the digestion of the fatty reserves.

Experiments with Etiolated Leaves. — In a paper published in No. 107 of the *Revue Générale de Botanique*, Palladine shows that when etiolated leaves free from carbohydrates are placed on the surface of various solutions, saccharose, raffinose, glucose, fructose, maltose, glycerine, galactose, lactose, and dextrine favor the formation in them of chlorophyll, while inulin and tyrosin produce no effect, and mannite, dulcite, asparagine, alcohol, and some other substances either retard or completely prevent the formation of the pigment.

Life History of Ranunculus. — To the *Botanical Gazette* for February, Prof. John M. Coulter contributes an addition to the life history of Ranunculus, embodying the results of the study of a number of research students at the University of Chicago. The results appear to justify the conclusion that while it is comparatively easy to obtain a definite sequence in the development of structures when the facts are few, definite sequences seem to disappear as facts multiply; a conclusion which may be paralleled in nearly or quite all

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[1] J. C. Arthur, *Laboratory Exercises in Vegetable Physiology.* Lafayette, Ind., 1897. Kimmell & Herbert.